REMARKS

Upon entry of the present reply, claims 1-27 remain pending and under rejection.

Reconsideration of the rejections of record and allowance of the application in view of the following remarks are respectfully requested.

Statement of Interview

Applicants express appreciation for the courtesies extended by Examiner McDonald to Applicants' representative Arnold Turk during a September 14, 2010 telephone interview.

During the interview, Applicants' method for producing an ultrabarrier layer system was discussed and contrasted with the protective layer system disclosed by Rauschnabel.[1] The Examiner was directed to the background section of Applicants' specification wherein it is disclosed that barrier layers are used to inhibit diffusion and they reduce permeation through a coated substrate. It was noted that frequent applications are found wherever the object is to prevent certain substances, e.g., foodstuffs as goods for packaging, from being able to come into contact with oxygen from the environment or water from being able to exchange with the environment. It was noted that, for example, a primary focus is thereby on an oxidative reaction or perishability of the substances to be protected. In addition, it was noted that the protection of various oxidation-susceptible substances when they are integrated into layer composites is also taken into consideration. For example, it was noted that the protection

[1] Throughout this response U.S. Patent No. 6,613,393 to Rauschnabel et al. and WO 99/63129 to Rauschnabel et al. will be referred to separately as Rauschnabel-US and Rauschnabel-WO and collectively as Rauschnabel.

of these substances is of particular importance when retarding the oxidative reaction determines the life of products.

It was noted that barrier layers pose in part a very differing resistance to different diffusing substances, and that the permeation of oxygen (OTR) and water vapor (WVTR) under defined conditions through the substrate provided with the barrier layer is often cited to characterize barrier layers.

Applicants' representative pointed out that Applicants' specification beginning at page 1, fourth paragraph, specifically provides a definition for ultrabarrier layer and Applicants' recited ultrabarrier layer system would, by definition, have these parameters. Thus, as disclosed in Applicants' specification, within the meaning of the invention, ultrabarrier layers are understood to be layers, the barrier effect of which prevents permeation values of WVTR = 0.05 g/m^2d and OTR = 0.2 cm^3/m^2d from being exceeded (WVTR according to DIN 53122-2-A; OTR according to DIN 53380-3).

Moreover, the Examiner's attention was directed to Applicants' specification, the paragraph beginning at the bottom of page 6, wherein characteristics of Applicants' recited smoothing layers are disclosed. In particular, it was noted that through layer deposition by means of an organometallic precursor, intermediate layers (referred to as smoothing layers) are formed that cause a particularly effective increase in the barrier effect of the ceramic layers. Applicants' representative noted that apparently these smoothing layers have a structure that prevents the growth of defects in the ceramic layers from continuing over several layers. Thus, although new defects can form in each individual ceramic layer, which defects in some cases can extend through the entire thickness of the individual layer, the defect growth ends at the smoothing layer. Defects

in one ceramic layer located in a layer stack thus cannot initiate the defect growth in another ceramic layer. Applicants' representative noted that the intermediate layers, which are called smoothing layers, lead to a smoothing of defective surfaces.

Applicants' representative pointed out that in contrast to Applicants' recited ultrabarrier layer system and its associated characteristics, Rauschnabel is directed to protective layers that are wear protection layers. It was pointed out that the first paragraph under the SUMMAY OF THE IVNENTION of Rauschnabel discloses that an object of the Rauschnabel invention is to develop a method of combining incorporated or multiple-ply layers that possess optical properties, in particular UV properties such as resistance to and absorption or reflection of UV radiation, with high wear resistance on substrates, in particular, substrates than can degrade upon weathering, for example, plastic components.

Applicants' representative pointed out that the rejection appeared to be relying on inherency to assert that the protection layer system of Rauschnabel would inherently be an ultrabarrier layer system as recited by Applicants. It was pointed out that in order for inherency to be present the result must be a necessary result and not merely a possibility.

Arguments were also emphasized as presented in Applicants' previous response, and the examiner indicated that he will consider these arguments in Applicants' written response.

Claim of Foreign Priority

Applicants express appreciation for the acknowledgement of the claim of foreign priority and receipt of the certified copy of the priority application.

Response To Rejections Based Upon Prior Art

The following art based rejections are set forth in the Final Office Action.

(a) Claims 1, 2, 5-7, 9-14, 17, 19-21 and 23-26 are rejected under 35 U.S.C. 102(a) [apparently should be 102(b)] as being anticipated by U.S. Patent No. 6,613,393 to Rauschnabel.

(b) Claims 1, 2, 5-7, 9-14, 17, 19-21 and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 99/63129 (which is the corresponding International Application of U.S. Patent No. 6,613,3930) to Rauschnabel-WO.

(c) Claims 3, 4, 8, 22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,613,393 to Rauschnabel-US or WO 99/63129 to Rauschnabel-WO. in view of WO 03/048406 A2 to Landgraf et al. (hereinafter "Landgraf-WO") with US 2005/0040034 A1 being used as English translation (hereinafter "Landgraf-US").

(d) Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,613,393 to Rauschnabel-US or WO 99/63129 to Rauschnabel-WO in view of U.S. Patent No. 5,464,710 to Yang.

(e) Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,613,393 to Rauschnabel-US or WO 99/63129 to Rauschnabel-WO in view of U.S. Patent No. 4,715,319 to Bringmann et al. (hereinafter "Bringmann").

(f) Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,613,393 to Rauschnabel-US or WO 99/63129 to Rauschnabel-WO in view of U.S. Patent No. 4,619,865 to Keem et al. (hereinafter "Keem").

As discussed with the Examiner during the above-noted interview and as previously argued by Applicants, Rauschnabel does not teach each and every feature recited in Applicants' claims so as to constitute anticipation. Moreover, one having ordinary skill in the art would not have combined the disclosures of the documents in the manner asserted in the rejections. Moreover, even if for the sake of argument the disclosures were combined, Applicants' claimed subject matter would not have been arrived at. Moreover, any combination of the prior art would not achieve the advantages associated with Applicants' claimed subject matter.

Applicants' independent claim 1 is directed to a method for producing an ultrabarrier layer system comprising vacuum coating on a substrate a layer stack comprising an alternating layer system of at least one smoothing layer and transparent ceramic layers, and comprising the at least one smoothing layer between two transparent ceramic layers, which transparent ceramic layers are applied by sputtering, and a monomer is admitted into an evacuated coating chamber in which a magnetron plasma is operated during deposition of the at least one smoothing layer.

Thus, Applicants' independent claim 1 is directed to a method of producing an ultrabarrier layer system. Such a system as defined in Applicants' originally filed application is defined in the fourth paragraph on page 1 of Applicants' originally filed specification as:

> Within the meaning of the invention, ultrabarrier layers are understood to be layers, the barrier effect of which prevents permeation values of WVTR = 0.05 g/m^2d and OTR = 0.2 cm^3/m^2d from being exceeded (WVTR according to DIN 53122-2-A; OTR according to DIN 53380-3).

In contrast, Rauschnabel is not directed to a method for producing an ultrabarrier layer system. Rauschnabel is directed to a method for applying wear protection layer system having optical properties onto surfaces. While Rauschnabel discloses within his disclosure certain materials that can be used in Applicants' ultrabarrier layer system, the rejection does not point to any disclosure in Rauschnabel that would inherently provide a method of producing an ultrabarrier layer let alone the ultrabarrier layer system as recited in Applicants' claims.

The Examiner is reminded that in order for inherency to be present the Examiner has the burden of showing that the result indicated by the Examiner is the necessary result, and not merely a possible result. In re Oelrich, 212 U.S.P.Q. 323 (CCPA 1981); Ex parte Keith et al., 154 U.S.P.Q. 320 (POBA 1966). For example, the fact that a prior art article may inherently have the characteristics of the claimed product is not sufficient. Ex parte Skinner, 2 U.S.P.Q.2d 1788 (BPAI 1986).

As the Board of Patent Appeals and Interferences states in Ex parte Levy, 17 U.S.P.Q.2d 1461, 1463:

> However, the initial burden of establishing a prima facie basis to deny patentability to a claimed invention rests upon the examiner. In re Piasecki, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984). In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986); W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983); In re Oelrich , 666 F.2d 578, 212 USPQ 323 (CCPA 1981); In re Wilding, 535 F.2d 631, 190 USPQ 59 (CCPA 1976); Hansgirg v. Kemmer, 102 F.2d 212, 40 USPQ 665 (CCPA 1939).in order for inherency to be present it must be a necessary result, and not merely a possible results. Ex parte Keith and Turnquest, 154 U.S.P.Q. 320 (B.O.A. 1966).

Accordingly, the rejection must establish that the method for applying a wear protective layer system of Rauschnabel would either explicitly or inherently produce an ultrabarrier layer system as recited in Applicants' claims.

However, the rejection does not point to any disclosed embodiment of Rauschnabel that anticipates Applicants' recited method for producing an ultrabarrier layer system. If the rejection is relying upon the embodiment of Fig. 2 of Rauschnabel, this embodiment only discloses layers 22 made of sputtered metal compound and polysiloxane layers 21 with a substrate 20. There is no teaching or suggestion in Rauschnabel that any of these layers be applied in any manner to produce an ultrabarrier layer system let alone to arrive at Applicants' recited method of producing an ultrabarrier layer system.

Still further, as previously argued by Applicants, the following arguments also pertain to the rejections set forth in the Final Office Action.

Ultrabarrier layer system

The rejection contends that Rauschnabel teaches a method for producing an ultrabarrier layer system. In contrast, Rauschnabel is directed to methods for producing **wear protection** layers and the resulting layer systems. For example, the title of Rauschnabel is "Method for Applying a Wear Protection Layer System Having Optical Properties Onto Surfaces". As noted above, a wear protection layer is not inherently a barrier layer, and a barrier layer is not inherently a wear protection layer. The requirements for a wear protection layer are different from the requirements for a barrier layer. Consequently the properties of a wear protection layer are different from the

properties of a barrier layer. The rejection improperly does not address that Rauschnabel discloses producing a wear protection layer and does not disclose producing an ultrabarrier layer as recited by Applicants.

Differences of the two layers are readily apparent for one having ordinary skill in the art. For example, important requirements for a wear protection layer are high scratch resistance and low abrasion. The problem for a wear resistant layer is to find a useful compromise between high hardness and high flexibility of the layer. In contrast, the most important requirement for a barrier layer is a low permeation of oxygen and water vapor, as see, for example, the above-noted third full paragraph on page 1 of Applicants' application. Consequently, the requirement for a good barrier is to find a layer or a layer structure with a low defect density. In fact, requirements for an ultrabarrier layer or ultrabarrier layer system are high, and are specified within the meaning of the invention in the fourth full paragraph on page 1 of Applicants' application.

There does not appear to be any disclosure in Rauschnabel, either explicitly or implicitly, that his disclosed layers meet requirements of an ultrabarrier layer system, including any indication that the layers or layer systems of Rauschnabel have a permeation barrier against oxygen and water vapor to constitute the producing of an ultrabarrier layer system as recited by Applicants. Thus, Rauschnabel is without any teaching or suggestion to arrive at a method of producing an ultrabarrier layer system let alone the methods recited in Applicants' claims.

Ceramic layer

Rauschnabel discloses at column 3, line 60 to column 4, line 15, the depositing of a wide range of layer materials (such as oxides, silicides, carbides, borides, nitrides,

sulfides, fluorides, selenides, tellurides ...) by sputtering to realize an UV protective layer. However, Rauschnabel does not appear to disclose the deposition of at least two transparent **ceramic** layers by sputtering to obtain an ultrabarrier layer system.

Transparent layer

Applicants' independent claim 1 includes, amongst the other recitations included therein, two transparent ceramic layers, which transparent layers are applied by sputtering. In the range of materials disclosed in Rauschnabel for the deposition by sputtering it is possible to retain at least silver, golden, yellow, red and green layers. It does not appear that Rauschnabel discloses at least two **transparent** ceramic layers by sputtering in an ultrabarrier layer system. **The rejections of record do not address this apparent deficiency of Rauschnabel.**

Smoothing layer

Applicants' independent claim 1 further includes an alternating layer system of at least one smoothing layer and transparent ceramic layers, and comprising at least one smoothing layer between two transparent ceramic layers, which transparent layers are applied by sputtering, and a monomer is admitted into an evacuated coating chamber in which a magnetron plasma is operated during deposition of the at least one smoothing layer. For example, attention is directed to Applicants' application to the paragraph beginning on page 6 and continuing thereafter. Such a smoothing layer prevents the growth of defects in the ceramic layers from continuing over several layers.

The only kinds of layers disclosed in Rauschnabel are UV protective layers and wear protective layers. It does not appear that Rauschnabel discloses that any of these layers is structured and/or arranged to prevent growth of defects in a ceramic layer from continuing over several layers and therefore **does not teach or suggest Applicants' recited smoothing layer**. Consequently, it does not appear that Rauschnabel teaches or suggests a method of producing an ultrabarrier layer system comprising smoothing layers.

Additionally, Applicants' independent claim 1 further recites that a monomer is admitted into an evacuated coating chamber in which a magnetron plasma is operated during deposition of the at least one smoothing layer.

Still further, the at least one smoothing layer is deposited under the influence of a **magnetron plasma**. For building a magnetron plasma a low pressure level in a vacuum chamber is required. In contrast, Rauschnabel discloses two kinds of layer systems for wear protection and two different apparatus for the deposition of the two kinds of layer systems.

A first layer structure is shown in Fig. 1 of Rauschnabel. This layer structure includes a single wear protection layer 11 which includes sputtered particles 12, with Rauschnabel disclosing, at column 6, lines 21-22 (bolded emphasis added), "...having a layer structure in the case of simultaneous operation of the sputtering and **microwave sources**." An apparatus for the deposition of such a single layer is shown in Fig. 3. This apparatus includes a reaction chamber 36 in which simultaneously is sputtered a target 35 for the particles 12 in layer 11 and a silicon monomer (fed by supply line 37 into chamber 36) and is activated by a **microwave plasma** and forms most of layer 11 by a CVD

process. Therefore, Rauschnabel discloses a microwave plasma in chamber 36 and not a magnetron plasma. See, for example, RAUSCHNABEL, column 6, lines 62 – 64 (with bolded emphasis added), "**A microwave generator 33 that generates the plasma** is mounted in the vicinity of the substrate".

A second layer structure is shown in Fig. 2 of Rauschnabel. This is a multilayer structure where wear protective layers 21 and UV protective layers 22 alternate. An apparatus for the deposition of such a layer system is shown in Figs. 4 and 5 of Rauschnabel. This is a multi-chamber facility and comprises four chambers which are separated from each other. Two chambers comprise PECVD facilities for the deposition of the layers 21 and two chambers comprise sputter systems for the deposition of the layers 22.

It is not possible to deposit the single mixed layer 11 from Fig. 1 with an apparatus shown in Fig. 4 and 5 because of the separated chambers; and it is not possible to deposit a layer system from Fig. 2 with an apparatus shown in Fig. 3 because the sputtering of a layer which consists only of sputtered particles (like layers 22) requires a low pressure level in the chamber and the deposition of a layer as an result of a microwave plasma enhanced CVD process (like layers 21) requires a high pressure level in the chamber. It is not possible to switch the different pressure levels in chamber 36 for the deposition of the different layers in the required time to deposit such a layer system.

The rejections continually point to isolated teachings throughout the entire disclosure of Rauschnabel as well as the other documents cited in the rejections, but does not indicate how these different isolated disclosures are combinable in each embodiment and/or that any disclosures are combinable to arrive at an ultrabarrier layer system.

Accordingly, the anticipation and obviousness rejections are without appropriate basis. **If any rejection is maintained, the Examiner is requested to specifically point out the basis for the combination set forth therein as well as that such combination is a method for producing an ultrabarrier layer.**

Applicants' claims are patentable at least for the above-noted deficiencies in Rauschnabel. Moreover, the dependent claims are patentable at least for the reasons set forth above, and for the additional features recited in the dependent claims in combination with the features from which the claims depend.

The other documents used in the rejections of record do not overcome the deficiencies of Rauschnabel. Landgraf is merely used is an obviousness rejection for magnetron plasma features. However, whether or not one having ordinary skill in the art would have combined the disclosures of Rauschnabel and Landgraf, which Applicants submit would not be combinable, Applicants' claimed subject matter would not be at hand at least because any such combination does not overcome the deficiencies of Rauschnabel.

Yang is merely used in an obviousness rejection for coating a web with a monomer. However, whether or not one having ordinary skill in the art would have combined the disclosures of Rauschnabel and Yang, which Applicants submit would not be combinable, Applicants' claimed subject matter would not be at hand at least because any such combination does not overcome the deficiencies of Rauschnabel.

Bringmann is merely used in an obviousness rejection for its disclosure of keeping the substrate at 35 degrees C during the coating process. However, whether or not one having ordinary skill in the art would have combined the disclosures of

Rauschnabel and Bringmann, which Applicants submit would not be combinable, Applicants' claimed subject matter would not be at hand at least because any such combination does not overcome the deficiencies of Rauschnabel.

Keem is merely used in an obviousness rejection for its disclosure that layers should range from 50 Angstroms to 5,000 Angstroms. However, whether or not one having ordinary skill in the art would have combined the disclosures of Rauschnabel and Keem, which Applicants submit would not be combinable, Applicants' claimed subject matter would not be at hand at least because any such combination does not overcome the deficiencies of Rauschnabel.

Moreover, regarding claim 2, Rauschnabel does not disclose a **magnetron plasma** operated in a pulsed manner with a pulse frequency of 1 kHz to 300 kHz. However, Applicants once again point out that the citation of Rauschnabel referenced in the rejection relates to a microwave plasma and not to a magnetron plasma.

Moreover, regarding claim 20, HMDSO in Rauschnabel (Column 2 lines 14 – 15) relates only to plasma polymerization and not to magnetron sputtering. See Rauschnabel (Column 2 lines 2 – 20). Still further, Rauschnabel (Column 4 lines 21 – 28) cites only gases which can be in a chamber during sputtering. Nowhere does Rauschnabel disclose alternating inlet of two gases in a chamber during sputtering. The rejection presently relies upon a combination of Figs. 2 and 3. However, these embodiments do not appear to be combinable.

Still further, claims 9 and 10 include that the deposition of the transparent ceramic layers takes place through magnetron sputtering. However, the rejection does not establish such features let alone such features in combination with independent claim 1.

Accordingly, at least for the reasons set forth above, the rejections of record should be withdrawn.

CONCLUSION

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections of record, and allow each of the pending claims.

Applicant therefore respectfully requests that an early indication of allowance of the application be indicated by the mailing of the Notices of Allowance and Allowability.

Should the Examiner have any questions regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
Dr. Christoph Charron et al.

/Neil F. Greenblum/
Reg. No. 28,394
Arnold Turk
Reg. No. 33094

September 23, 2010
GREENBLUM & BERNSTEIN, P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
(703) 716-1191